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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/666,302 | 09/19/2003 | Stephen F. Moxham | 03-0042 | 9041 |
| 22823 | 7590 | 05/25/2005 | EXAMINER | |
| STEPHEN A GRATTON THE LAW OFFICE OF STEVE GRATTON 2764 SOUTH BRAUN WAY LAKEWOOD, CO 80228 | | | BREWSTER, WILLIAM M | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2823 | |

DATE MAILED: 05/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/666,302

Applicant(s)

MOXHAM, STEPHEN F.

Examiner

William M. Brewster

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 75-87 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 75-87 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 040705.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

In view of the amendment and arguments filed 7 April 2005, all active claims are now examined.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9, 11, 12, 14-16, 75, 81, 84, 86, 87 are rejected under 35 U.S.C. 102(b) as being anticipated by Alcoe et al., US Patent No. 5,760,465.

Alcoe anticipates a system comprising: a substrate comprising a plurality of electrodes; and a semiconductor component on the substrate comprising: in fig. 1, a stiffener 19; semiconductor die 13 attached to the stiffener; a circuit decal attached to the stiffener comprising a plurality of conductors 24 and a polymer layer 29 on the conductors; an electrically insulating adhesive layer 17 in physical contact with the stiffener and the conductors, the adhesive layer attaching the circuit decal to the stiffener with the polymer layer forming an exterior surface of the component; a plurality of interconnects, 24, electrically connecting the die and the conductors; and a plurality

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of terminal contacts 25 on the conductors electrically isolated by the polymer layer and bonded to the electrodes, col. 5, line 38 - col. 6, line 46;

limitations from claim 2, the semiconductor component of claim 1 wherein the terminal contacts comprise balls or bumps in an area array: balls 25, col. 5, lines 46-52;

limitations from claim 3, the semiconductor component of claim 1 wherein the conductors comprise a plurality of contacts in an area array and the terminal contacts are formed on the contacts: parts of 24 and 25;

limitations from claim 4, the semiconductor component of claim 1, in fig. 6, further comprising a die encapsulant 43 on the stiffener encapsulating the die, col. 8, line 49-col. 9, line 6;

limitations from claims 5, 86, the semiconductor component, wherein the polymer mask 29 comprises a solder mask, to protect from solder balls, col. 5, lines 46-52;

limitations from claims 6, 12, the semiconductor component, wherein the stiffener comprises a metal selected from the group consisting of stainless steel, copper, nickel, titanium, aluminum, and alloys of these metals: copper or aluminum, col. 5, line 54 - col. 6, line 10;

limitations from claim 8, the semiconductor component of claim 7, in fig. 1, further comprising a plurality of terminal contacts 25 on the conductors 23 electrically isolated by the polymer mask 29, col. 5, line 46 - col. 6, line 9;

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limitations from claim 9, the semiconductor component of claim 7, in fig. 1, wherein the conductors 23 comprise a plurality of contacts for the terminal contacts 25 in an area array;

limitations from claims 14, 87, the semiconductor component of claim 11, in fig. 7, further comprising a die encapsulant 43, 63, 65, on the stiffener 13 encapsulating the die 19, col. 9, lines 7-37;

limitations from claim 16, the semiconductor component of claim 11, in fig. 1, wherein the terminal contacts 27 are arranged in an area array;

limitations from claim 85, the system of claim 81 further comprising a plurality of components on the substrate substantially identical to the component but having a different electrical configuration, wherein numerous sizes, designs and types of chips are allowed for, col. 2, line 61 - col. 3, line 27.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10, 13, 17, 18, 19, 76, 83-85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alcoe as applied to claims 1-9, 11, 12, 14-16, 75, 81, 83, 84, 86, 87 above, and further in view of Siu, US Patent No. 6,664,617 B2.

Alcoe does not specify using a multi-chip module, but Siu does. Siu teaches:

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limitations from claim 10, fig. 4A - 4D, limitations from claim 10, the semiconductor component of claim 7 further comprising a second semiconductor die 40 attached to the stiffener 220, col. 6, lines 43-54;

limitations from claim 13, the semiconductor component of claim 11, in fig. 1, wherein the interconnects comprise wires 50 bonded to the die 40 and to the conductors 30, col. 4, line 6 - col. 5, line 25;

limitations from claim 17, the semiconductor component of claim 11, in fig. 1, wherein the stiffener 20 includes a wire bonding opening, below 40, and the die 40 includes a circuit die 40 bonded to the stiffener 20, and a plurality of die contacts aligned with the wire bonding opening and wire bonded to the conductors 30, col. 4, line 6 - col. 5, line 25;

limitations from claim 18, the semiconductor component of claim 11 wherein the component comprises a ball grid array package, col. 5, lines 15-25;

limitations from claims 19, the semiconductor component, wherein the component comprises a multi chip module, col. 2, lines 6-11;

limitations from claim 76, the system of claim 75, in fig. 1B, wherein the substrate comprises a module substrate 30 et al., and the system comprises a multi chip module, col. 2, lines 6-14;

limitations from claim 83, the system of claim 81 further comprising a plurality of dice on the stiffener, col. 2, lines 6-11;

limitations from claim 84, the system of claim 81, in fig. 4B, 4C, further comprising a plurality of components 40, on the substrate substantially identical to the component,

limitations from claim 85, the system of claim 81, in fig. 4D further comprising a plurality of components 42, 40 on the substrate substantially identical to the component 42, but having a different electrical configuration.

Siu gives motivation in col. 1, lines 34 - 43. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Siu's process with Alcoe's invention would have been beneficial because it improves the space requirement.

Claims 77-80, 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alcoe as applied to claims 1-9, 11, 12, 14-16, 75, 81, 83, 84, 86, 87 above, and further in view of Muthukumaraswamy et al., US Patent No. 6,229,227 B1.

Alcoe does not specify all the different end products, the device may be used in, but Muthukumaraswamy does. Muthukumaraswamy teaches,

limitations from claim 77, the system of claim 75, in fig. 10, wherein the substrate is contained in a computer 1006, col. 14, lines 5-19;

limitations from claim 78, the system of claim 75, in fig. 11, wherein the substrate is contained in a camcorder 1108, col. 14, lines 20-30;

limitations from claim 79, the system of claim 75, wherein the substrate is contained in a camera, 1108, col. 14, lines 20-30;

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limitations from claim 80, the system of claim 75, in fig. 15,
wherein the substrate is contained in a cell phone 1508, col. 15, lines 50-65;
limitations from claim 82, the system of claim 81, in fig. 15, wherein the system
comprises a multi chip module, a computer, a camcorder, a camera or a cell
phone: cell phone, 1508, col. 15, lines 50-65.

It would have been obvious to a person of ordinary skill in the art at the time the
invention was made to recognize that combining Muthukumaraswamy's process with
Alcoe's invention would have been beneficial because it allows for multiple products
enabling a wider market.

Any inquiry concerning this communication or earlier communications from the
examiner should be directed to William M. Brewster whose telephone number is 571-
272-1854. The examiner can normally be reached on Full Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number
for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

William M. Brewster

20 May 2005

WB